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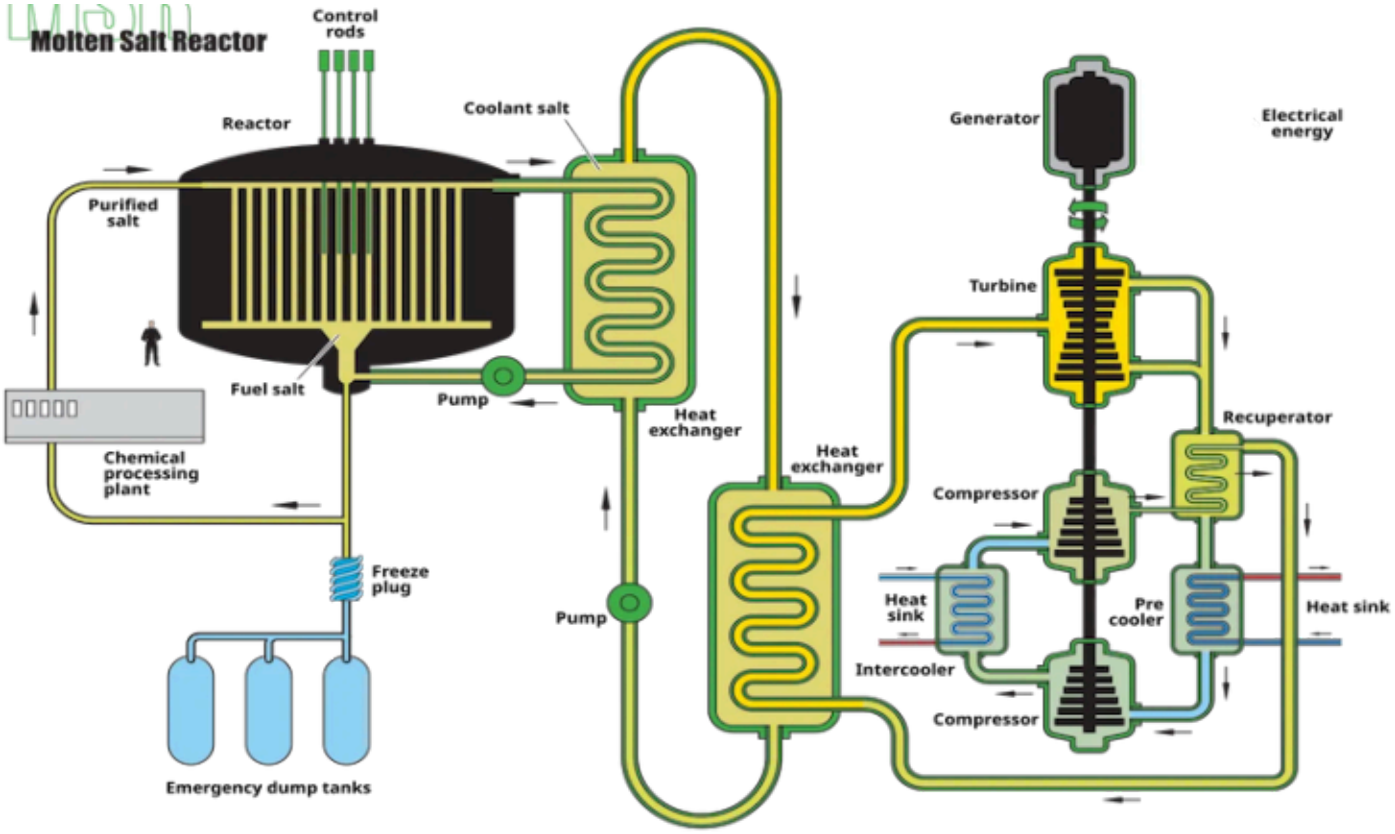

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by **Arnaud Bertrand**

I'm not making this up. In the 1960s, the United States, specifically Oak Ridge National Laboratory in Tennessee, invented a revolutionary type of nuclear reactor that could run on thorium instead of uranium (which was much more abundant and cheaper), without the risk of meltdown, generating 50 times less waste, and requiring no water. Then, due to disorganized politics, the program was abandoned in 1969, and the visionary scientist behind the invention was sent home.

Subsequently, the declassified plans for the project remained forgotten in the archives for decades. Until Chinese scientists found them and decided, in 2011, to conduct an experimental project in the Gansu desert to see if they could make it work.

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A few days ago, after 14 years of work, they finally succeeded.

Here's the full story. How the technology works, the bureaucratic politics that killed it in the United States, and why it could truly be a game changer.

Technology

First of all, let me explain conventional nuclear energy because I have realized during discussions over the past few days that many people are not very familiar with how it works.

A conventional nuclear power plant is basically like a giant kettle for boiling water. At its core, that's essentially it: you trigger a nuclear chain reaction in uranium fuel rods (atoms split and release particles that split more atoms, i.e., "fission"), this generates a crazy amount of heat, you use that heat to boil water into steam, and the steam spins turbines to produce electricity.

What's rather funny is that many people don't realize that a nuclear power plant isn't fundamentally that different from the 18th-century steam engine. It's the same basic concept, with steam doing the work, except that instead of burning coal to heat water, we use uranium fuel rods.

Quite simple in theory, but as we all know, in practice, conventional nuclear energy has some rather significant drawbacks:

- Safety. We all know this problem: conventional nuclear power plants have a nasty tendency to melt down and render entire regions radioactive and uninhabitable for millennia. Which is, let's say, a less than desirable outcome. It's true that this has only happened twice in history, but the risk is very real.
- Uranium shortage. These substances are relatively rare and concentrated in only a few countries (just four countries – Kazakhstan, Canada, Namibia and Australia – together produce 80% of the world's uranium).
- Fuel inefficiency. Conventional reactors extract only about 1 to 3% of the energy contained in uranium before the fuel rods are "exhausted." You are literally throwing away 97 to 99% of the fuel as radioactive waste.
- Nuclear waste. Spent fuel remains lethally radioactive for tens of thousands of years. We have no permanent storage solutions, only temporary facilities and a great deal of optimism – probably naive – that future generations will discover a way to remedy the situation.

Because of all these drawbacks, scientists have been searching for alternatives for decades. And in fact, they found one by going back to the 1940s, to Oak Ridge National Laboratory in Tennessee, an R&D center funded by the US government.

The idea is actually quite simple: if a meltdown – like when uranium fuel rods get so hot they melt – is the main danger of conventional nuclear power plants, why don't we make nuclear fuel liquid? *There's nothing to melt if it's already melted... And there you have the basic idea of the "Molten Salt Reactor" (MSR).*

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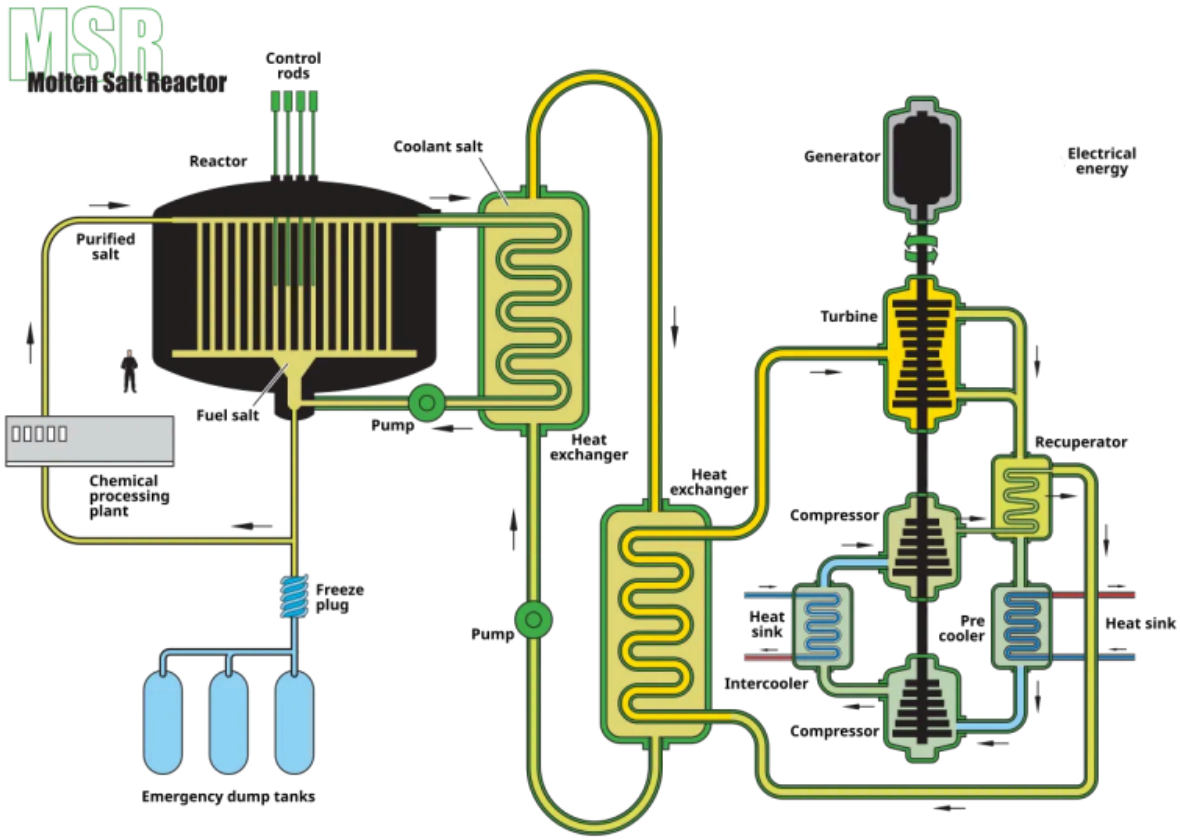

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Example of a molten salt reactor diagram.

The way it works is that you take special salts (like fluoride salts) and heat them until they liquefy, at around 500°C. Then you dissolve your nuclear fuel (thorium or uranium) directly into this molten salt and have the nuclear chain reaction happen there in the liquid – the atoms split, release heat, and heat the salt itself.

How is this safer, I hear you ask? Thanks to a rather ingenious design where the bottom of the reactor itself is made of unmelted salts that would melt if the molten salts ever overheated (the "freezing plug" you see in the diagram above). And if these unmelted salts were to melt, it would automatically cause the overheated molten salts to fall—by gravity alone—into silent emergency tanks whose geometry (they are large, flat containers) would automatically stop the nuclear reaction.

Think of it this way. Imagine, for the sake of argument, that you're building a campfire—a tightly packed bundle of burning sticks—above a thick layer of ice, a few feet below which lies flat concrete. If your campfire gets too hot, the ice melts and your sticks spread flat on the concrete below: the fire goes out because it can't jump between the sticks. A fairly similar concept.

To be clear, in this MSR concept, these hot molten salts mixed with nuclear fuel still need to heat water (or another gas, as we'll see later) into steam to drive turbines and generate electricity; the same basic principle as conventional reactors. But here's the key difference: the radioactive molten salt flows through metal pipes inside a heat exchanger, where it heats the clean water flowing on the other side without the two ever mixing.

Langues »

This means the radioactive salts remain completely separate in their own closed loop, while only clean, non-radioactive steam goes to the turbines. If there's a leak in the steam system, you don't release radioactive material into the environment, you simply release clean water.

There's another equally important but less obvious safety advantage: MSRs operate at atmospheric pressure—the same pressure as the air around us. Conventional reactors operate at over 150 atmospheres because they use water as a coolant, and to keep water liquid at 300°C+—three times its normal boiling point—you need intense pressure. This means conventional reactors require massive steel pressure vessels with walls up to a foot thick, weighing hundreds of tons. And if these vessel systems were ever to fail, you'd have a massive explosion: a bit like a car tire blowing out, only the size of a nuclear power plant, and it would spread deadly radioactive elements everywhere. By comparison, if an MSR pipe leaks, you just get a slow drip of molten salt that solidifies on contact with the air: annoying, but not catastrophic.

This also has an incidental and enormous impact on the economy: the pressure vessel alone accounts for a large part of the reason why conventional nuclear power plants cost $6 to $10 billion each (or, in the case of Vogtle, the last nuclear power plant in the United States, $18 billion each (https://en.wikipedia.org/wiki/Vogtle_Electric_Generating_Plant)and take a decade to build (11 years in Vogtle's case). Eliminating the pressure requirement makes MSRs considerably cheaper and faster to build.

So much for safety. How are the other drawbacks addressed? Let's now examine the scarcity of uranium and the inefficiency of the fuel.

The huge advantage of MSRs is that, unlike conventional reactors, you can use thorium instead of uranium. This is enormous because thorium is a much more common element (https://en.wikipedia.org/wiki/Abundance_of_elements_in_Earth%27s_crust) than uranium: it occurs at about 9-10 parts per million (ppm) in the earth's crust – about as common as lead – compared to only 2-3 ppm for uranium.

A key aspect to understand, however, is that thorium, unlike uranium, is NOT a so-called "fissile" material, meaning it cannot sustain a nuclear chain reaction on its own. It is simply "fertile," meaning it can become "fissile," but only after being transformed, in this case, into uranium-233.

This is called "reproduction." You create nuclear fuel from non-combustible material. The transformation process goes like this: when a Thorium-232 atom absorbs a neutron (remember, neutrons are constantly flying around in an active reactor because of atom splitting), it becomes Thorium-233. Then, Thorium-233 naturally decays—in about 22 minutes—into Protactinium-233. Protactinium-233 then decays, in about 27 days, into Uranium-233. And there you have it: Uranium-233 is fissile, which means it can now split and sustain the chain reaction. So, in about a month, you've converted a non-combustible atom (thorium) into a combustible atom (Uranium-233) simply by letting it sit in the reactor to absorb neutrons. As long as you keep adding thorium and it keeps absorbing neutrons, you are continually producing new fuel.

Wait, why can't you do this "reproduction" by converting Thorium-232 into fissile Uranium-233 in a conventional reactor? Technically, you could, but you'd face an insurmountable problem: you can't achieve a self-sustaining reproduction cycle with solid fuel. So, you would produce U-233, but not enough to both sustain the reaction AND produce more U-233 from fresh thorium. You would remain dependent on imported uranium and end up back at the same problem.

The beauty of MSRs, however, is that because the fuel is liquid and fluid, you can continuously add fresh thorium. The uranium-233 replicates and remains in the liquid, where it immediately participates in the nuclear chain reaction AND in the production of more uranium-233 from the thorium, while the whole system continues to operate and generate energy. In essence, you have created a perpetual motion machine for nuclear fuel: the reactor manufactures its own fuel from thorium while simultaneously operating with that fuel, reproducing more as it burns it.

There is another huge advantage. Remember how conventional reactors only extract about 1 to 3% of the energy contained in uranium before the fuel rods are "exhausted." This is because fission waste accumulates in the solid fuel and poisons the reaction, causing it to stop, much like bread dough stops rising once too much CO2 builds up; the reaction waste eventually stifles the reaction itself.

There isn't such a problem with MSRs because in a liquid-fueled system, you can chemically remove the fission waste from the liquid salt flowing out while the reactor continues to operate, thus extracting nearly 99% of the fuel's energy, instead of wasting 97-99%. That's a 30- to 50-fold improvement in energy efficiency!

This means our nuclear waste problem is also largely solved. First, there's 30 to 50 times less waste because you extract 30 to 50 times more energy from the fuel; basic math. Second, the small amount of waste that remains is much less harmful: unlike conventional reactor waste, which remains dangerously radioactive for tens of thousands of years (longer than recorded human history), MSR waste only needs secure storage for 300 to 500 years. That's still a long time, but building storage facilities that last a few centuries is a relatively trivial engineering challenge; we know how to do that, whereas we don't know how to build anything designed to remain safe for potentially 100,000 or 200,000 years.

One final critical point: unlike conventional reactors, MSRs do not need to be built near massive water sources; they can be built virtually anywhere. In fact, the Chinese MSR “TMSR-LF1,” the revolutionary project we are discussing, is located in Minqin County, Gansu Province, one of the driest regions in China, right on the edge of the Gobi Desert (see screenshot below). View the map yourself here (https://maps.app.goo.gl/xHnEajx52W6UYRjg9)).

(https://i0.wp.com/reseauinternational.net/wp-content/uploads/2025/11/image-96.png?ssl=1)

The Chinese MSR factory "TMSR-LF1" is located in Minqin County, in the province from Gansu, one of the driest regions in China.

Wait, I hear you saying, I thought MSRs also had to vaporize water to spin the turbines and produce electricity? Well, not always: remember how I wrote "*or another gas, as we will see later*"As a warning?" It is. The current reactor is a demonstration project testing the thorium fuel cycle without generating electricity (so there's no turbine), but China is already starting to build the actual plant on the same site: a 60 MW reactor that will produce 10 MW of electricity using supercritical carbon dioxide turbines instead of traditional steam. The CO2 remains in a closed, pressurized loop; hot molten salt heats it, it spins the turbine, ambient air cools it, and the cycle starts again. No water is needed anywhere in the system.

In practical terms, this means that MSRs can be deployed in water-poor western provinces of China (such as North Gansu in this case), in the deserts of Central Asia along the New Silk Roads, or even – let me amaze you here – on the moon (Yes, really! (https://www.reuters.com/business/energy/china-led-lunar-base-include-nuclear-power-plant-moons-surface-space-official-2025-04-23/)). Wherever a strategic need requires it, regardless of water availability.

Okay, I admit it, it's gotten a bit technical. But you needed to understand what MSRs actually do and why they're revolutionary, otherwise this article wouldn't make much sense.

One thing I haven't explained, however, is the fate of the Oak Ridge program: why did America invent such a promising technology, successfully demonstrate it, then stop the program and publish all the research publicly? The great irony is that the Chinese MSR program, which could be the key to its future, is built on the

Langues »

basis of declassified American plans.

The Oak Ridge program

Here's what makes this story particularly "embarrassing" from an American perspective, especially if MSRs live up to their promise and end up becoming very significant for China's energy future: America hasn't just theorized about molten salt reactors, they've actually built one!

In Oak Ridge in the 1960s, director Alvin Weinberg (https://en.wikipedia.org/wiki/Alvin_M._Weinberg) He sincerely believed that MSRs were the future of nuclear energy. He convinced the Atomic Energy Commission to fund a proper test. The Molten Salt Reactor (MSRE) experiment lasted from 1965 to 1969, four years, recording over 13,000 hours of operation (https://www.ornl.gov/blog/time-warp-molten-salt-reactor-experiment-alvin-weinbergs-magnum-opus)They proved that the concept worked. The molten salt supply circuit was stable. The passive safety devices worked exactly as intended (those I explained above with the campfire-on-ice analogy).

They never demonstrated the complete replication cycle—transforming thorium into uranium-233 inside a running reactor—but they had sufficiently proven that the path forward was clear. Weinberg continued his search. He had the data. He had the operational experience. He had a technology that could solve the biggest problems in nuclear power.

Then politics got involved.

In the early 1970s, the Nixon administration decided that the future belonged to the Liquid Metal Fast Breeder Reactor (LMFBR)—a competing technology. The man tasked with making it happen was Milton Shaw, who headed the reactor division of the Atomic Energy Commission. Shaw was a protégé of Admiral Rickover, the legendary and abrasive father of the nuclear navy. He had completely absorbed his mentor's management style (https://energyfromthorium.com/2008/09/23/milton-shaw-and-the-decline-of-the-american-nuclear-establishment/) : in my way, no discussion, and if you are not with me, you are against me.

Weinberg continued to advocate for molten salt reactors. Worse still, he kept publicly highlighting the safety problems associated with building conventional reactors everywhere; the kind of truth that makes bureaucrats nervous. This made him a nuisance.

According to Weinberg's own words (https://moltensalt.org/references/static/downloads/pdf/WhyMSRsAbandonedORNLWeinbergsFiringV3.pdf) : "*It was clear that* [Shaw] *had little confidence in me, or indeed in Oak Ridge National Laboratory. After all, we were pushing for molten salt, not LMFBR*».

He was dismissed in 1973. By that time, the molten salt reactor was already dead; Shaw had forced it to close in 1969.

Shaw's team produced a report (WASH-1222 (https://7c17075a.flowpaper.com/WASH12221/)) declaring that the MSRs "*required too much development*while designating the LMFBR as the "*mature technology*that America had to pursue. It didn't matter that the MSR had been operating for several years while the LMFBR was still in the planning stages. Political decisions don't require logical consistency.

Langues »

And of course, this proved to be a bad choice: the LMFBR technology*mature*" on which the United States staked everything has led absolutely nowhere. They tried to develop a project around it called the Clinch River breeder reactor (https://en.wikipedia.org/wiki/Clinch_River_Breeder_Reactor_Project)Authorized in 1970 with an initial price of $400 million, the project saw costs balloon to $8 billion by 1983, with no end in sight. Congress halted funding in October 1983; the reactor was never completed, and not a single watt of electricity was ever produced.

This loss for America became a gain for China in the most literal way possible. Oak Ridge, as was typical for such a project, had documented its work with hundreds of technical reports, semi-annual progress reports from 1958 to 1967, detailed technical specifications, materials science data, and MSRE operational logs. After the program's end in 1976, these reports became publicly available, having been found in largely forgotten technical libraries and archives.

In 2002, Kirk Sorensen, an aerospace engineer at NASA, discovered them and, with his colleague Bruce Patton, obtained funding (https://energyfromthorium.com/2011/04/26/five-years-eft/) to digitize them. In 2006, Sorensen had created *energyfromthorium.com* (https://energyfromthorium.com/)and published everything online as a public repository. Free. Accessible to all.

China used this publicly available American research as the basis for its MSR program, a fact it openly acknowledges. Xu Hongjie, lead scientist for China's MSR project, he said during a meeting of the Chinese Academy of Sciences (https://www.scmp.com/news/china/science/article/3306933/no-quick-wins-china-has-worlds-first-operational-thorium-nuclear-reactor) earlier this year:*The United States made its research publicly available, while awaiting a suitable successor. We were that successor.*».

The truth is, a revolutionary scientific technique shouldn't gather dust for half a century simply because one country lost its composure. If America wasn't willing to embrace Weinberg's vision, someone else had to. That someone turned out to be China.

China's latest breakthrough

China did not simply dust off the plans for Oak Ridge and build a replica. They did what Weinberg never had the chance to finish: they completed the circle.

Remember the critical missing piece of the Oak Ridge experiment? The MSRE proved you could run a molten salt reactor. It proved the safety systems worked. It even proved you could use uranium-233 as fuel. But it never demonstrated the self-replicating cycle—the reactor continuously creating its own fuel from thorium while operating, the "*perpetual motion machine*"which I described earlier. It was the holy grail, the thing that would make the whole concept revolutionary rather than interesting."

A few days ago, China achieved this.

Their TMSR-LF1 reactor in Gansu has successfully completed the world's first conversion of thorium to uranium inside an operating molten salt reactor. The Shanghai Institute of Applied Physics of the Chinese Academy of Sciences announced that it had obtained

Langues »

(https://www.chinadaily.com.cn/a/202511/05/WS690aa6e3a310f215074b9062.html) valid experimental data proving the operation of the thorium fuel cycle; thorium-232 continuously capturing neutrons and transforming into uranium-233 inside the operating reactor.

This may seem like a gradual step:*Okay, they succeeded, so what?*"But understand what this unlocks: it proves that the thorium fuel cycle works. This means that China can now, in principle, design and build reactors that can operate indefinitely on thorium, available on the domestic market, without dependence on foreign uranium supplies and without vulnerability to supply chain disruptions."

In fact, according to Cai Xiangzhou (https://www.chinadaily.com.cn/a/202511/05/WS690aa6e3a310f215074b9062.html), deputy director of the Shanghai Institute of Applied Physics (which is leading the project), China has virtually NO external dependence on this technology:*Over 90% of the reactor's components are produced domestically, with 100% localization of key parts and a completely independent supply chain. This achievement marks the initial establishment of an industrial ecosystem for thorium molten salt reactor technologies in China.*».

And that's not even mentioning thorium itself, of which China has enormous reserves. Some estimates suggest they would be enough to power the country for 20,000 to 60,000 years. That's not a typo. Tens of thousands of years of energy independence thanks to domestic resources, with technology that China now controls from start to finish.

To be clear, there is still a long way to go. The current TMSR-LF1 is a 2-megawatt thermal demonstration reactor – it simply proves that the reproduction cycle works, but it does not produce electricity. It is essentially a proof of concept:*Yes, we can produce uranium-233 from thorium in a molten salt reactor.*A critical milestone, but not yet a power plant.

The next stage is already underway. Construction began this year on what is effectively the larger counterpart to TMSR-LF1 at the same Gansu site: a reactor that will add the power generation component. It is designed to produce 10 MW of electrical power using the supercritical carbon dioxide (sCO2) turbines I mentioned earlier.

The incredible thing, which truly highlights China's level of ambition on this project, is that the sCO2 turbines themselves are cutting-edge technology. In fact, as far as I know, this would be the first nuclear power plant in the world to use this turbine technology for electricity generation. According to the Wisconsin Energy Institute (https://energy.wisc.edu/industry/technology-highlights/supercritical-co2-gas-turbines)Replacing traditional steam turbines with sCO2 closed-cycle gas turbines could increase electricity generation efficiency by 50% or more; a transformative improvement for any electricity generation technology.

Thus, China is simultaneously demonstrating a brand-new nuclear reactor technology (thorium-replicating MSR) AND a revolutionary turbine technology (supercritical CO2), and they're building all of this as an integrated power plant in the Gobi Desert. What ambition!

If it works—and the most complicated part has just been done—China will have surpassed conventional nuclear power in a whole new category of electricity generation. Not only safer and cheaper than traditional reactors, but fundamentally more efficient at converting heat into electricity. And of course, once again, all using abundant thorium as the energy source.

Langues »

The final step is to demonstrate the state of readiness for commercialization. Cai Xiangzhou says (https://www.chinadaily.com.cn/a/202511/05/WS690aa6e3a310f215074b9062.html) that the objective is "*to complete the construction and demonstration of a 100-megawatt thermal prototype by 2035 and to achieve a commercial-scale application*"A 100 MW reactor is small compared to conventional nuclear standards – most modern reactors are over 1000 MW – but it is large enough to validate the economic and operational characteristics required for commercial deployment.

If a 100 MW thorium MSR can operate reliably and generate electricity at a competitive cost, China will have everything it needs to begin building these reactors commercially. And given that it controls the entire supply chain domestically—from the thorium itself to every key component—there are theoretically no technical or geopolitical barriers preventing it from building dozens, then hundreds, of these reactors across the country.

To be clear, in theory, the energy generated by MSRs should be much cheaper than conventional nuclear power (which is already relatively cheap). This makes sense: thorium is cheaper than uranium, there's better fuel utilization—30 to 50 times more—MSRs will be much cheaper to build (remember: no massive pressurized vessel), you can refuel live while the plant is running, and so on. Of course, "in theory" and "in practice" are separated by years of troubleshooting, unforeseen engineering challenges, and the harsh realities of real-world operations. China has made a massive bet that the theory can be realized in practice. But if they're right—and nothing so far indicates they aren't—they'll be at least a decade ahead of everyone else.

Long-term consequences

If the MSR bet comes to fruition, what it could ultimately mean for China's strategic position is almost too great to comprehend.

First, the obvious: independence from energy bottlenecks. No Strait of Hormuz. No Strait of Malacca. No vulnerability to a naval blockade of oil shipments.

Secondly, it's not just about electricity generation: abundant and cheap energy is transforming all energy-intensive industries. Aluminum smelting, steel production, chemical manufacturing, semiconductor manufacturing, AI data center operations—all of these are becoming structurally even cheaper to operate in China than they already are. Even freight transport: just a few hours ago, China has announced its intention (https://www.scmp.com/news/china/science/article/3331031/china-unveils-power-thorium-reactor-worlds-largest-cargo-ship) to build the world's largest cargo ship, powered by… you guessed it: a thorium-based molten salt reactor!

The country that already dominates the world's largest manufacturing capacity would gain yet another insurmountable cost advantage in the most strategic industries of the 21st century.

Third: deployment flexibility. China could build these safe nuclear power plants anywhere: in Tibet, Xinjiang, in the interior deserts, on cargo ships, on the moon—wherever strategic necessity demands it. Central Asian countries with no water resources but plenty of desert? Perfect candidates for MSRs. Pakistan, Kazakhstan, Uzbekistan—all potential customers for safe, Chinese-built thorium reactors that require no fuel or water imports and pose no meltdown risk.

Langues »

Fourth, the cascading effects on other technologies. Abundant and cheap electricity makes previously unprofitable processes viable. For example, large-scale hydrogen production for industry and transportation. It is probably no coincidence that the first 10 MW experimental reactor is currently under construction in Gansu. is already planned to produce (http://english.sinap.cas.cn/Highlights/202412/t20241204_893098.html) This is known as "purple hydrogen," a way to store energy in the form of hydrogen that can then be used as fuel for many applications. Traditional hydrogen production is expensive, but the bet is clearly that MSRs can make hydrogen production more efficient and economically viable.

But above all, this MSR project illustrates a deeper story: that of a China that dares where the West gives up. It's not just about MSRs: in virtually every energy source, in virtually every imaginable field, we see the same dynamic. We live in a world where bureaucracy and a lack of grand vision, of dreams, are not a reality in a country run by a Communist Party, but they are in countries that are not.

The story of China reviving Weinberg's dream is almost painfully symbolic. Plans for abundant energy were gathering dust in the archives because they didn't fit the political moment and were killed by bureaucracy. And here is China, working methodically with those declassified American documents, solving the problems Oak Ridge never could finish, building in Gansu the future Tennessee abandoned. A burgeoning civilization literally excavating and reviving the abandoned dreams of a declining one, the archaeologists of the future America forsook.

Addendum: The corrosion problem. Added November 7, 2025

Thank you all for the important responses to my article, I didn't expect the subject of thorium nuclear energy to fascinate so many people!

A common response I received, which I think is very interesting to develop further, is the belief that the American Oak Ridge project in the 1960s was stopped because of insurmountable corrosion problems and that at the time there was simply no material on earth capable of handling the deeply corrosive nature of molten salts.

First, it is true that corrosion WAS a major technical challenge at Oak Ridge. However, it was a challenge they were well on their way to resolving. Read this article from 1973 (https://energyfromthorium.com/2012/06/15/1973-news-article/) They explain that they invented an alloy called Hastelloy-N that could resist corrosion, but it itself had problems because it developed surface cracks. However, they also solved this problem by discovering that*By adding titanium to Hastelloy-N, both the cracking problem and the radiation embrittlement of Hastelloy-N could be mitigated.*».

You also this other document (https://energyfromthorium.com/2009/05/14/secretary-chus-answer-and-the-facts/) dating from the early 1970s in which they again explain that Hastelloy-N containing titanium and niobium would probably be perfect but that, given that the Oak Ridge reactor had been shut down, it could not be tested.

In other words, the corrosion problem had been largely solved—or at least was well on its way to being solved—and that's not what stopped the Oak Ridge project. What stopped it, as I explain in the article, was a spectacularly miscalculated bet by the United States: they believed the future of nuclear power lay with the

liquid-metal fast breeder reactor, not molten salt reactors. They poured billions of dollars into it, and it came to nothing.

As for China, it has also worked very hard on the issue of corrosion, with numerous research studies published on the subject. In their molten salt reactor in Gansu, they use an alloy called "GH3535"; essentially the improved Chinese version of Hastelloy-N developed by Oak Ridge.

GH3535 is a nickel-based superalloy with roughly the same chemical composition as Hastelloy-N (71% nickel, 16% molybdenum, 7% chromium and 4% iron - 5% in the case of Hastelloy-N) which has been specifically designed to resist corrosion by molten salts at temperatures around 700°C.

The Chinese have published numerous articles on this subject, including cutting-edge research in 2024-2025 on manipulating tellurium-induced grain boundary cracking (examples here (https://www.jcscp.org/article/2024/1005-4537/1005-4537-2024-44-5-1157.shtml) et here (https://link.springer.com/article/10.1007/s41365-025-01771-8)), which is remarkably similar to the exact problem Oak Ridge was trying to solve with their titanium-modified Hastelloy-N.

The big difference, of course, is that China's molten salt reactor actually works, and although they are still researching ways to optimize it further, it demonstrates that the corrosion problem could be solved with a good dose of commitment and patience.

source: Arnaud Bertrand (https://arnaudbertrand.substack.com/p/china-found-in-us-archives-an-energy) via The Francophone Saker (https://lesakerfrancophone.fr/la-chine-a-trouve-dans-les-archives-americaines-une-source-denergie-qui-pourrait-alimenter-son-avenir-pendant-20-000-ans-et-la-fait-fonctionner)

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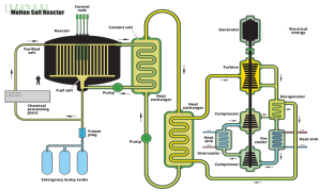

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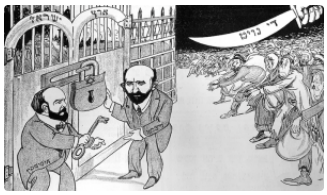

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